



Earth's Energy Sources

Pre-assessment activity from *The Science of Global Atmospheric Change Teacher's Guide*
and for *Mr. Slaptail's Curious Contraption*

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BioEdSM

Teacher Resources from the
Center for Educational Outreach at
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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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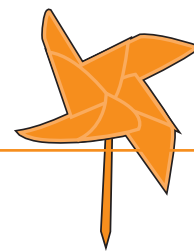
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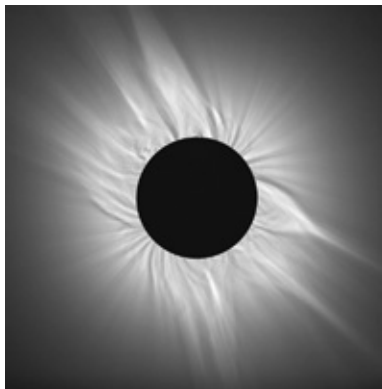
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Earth's Energy Sources

Pre-assessment



Global warming, ozone depletion, skin cancer risk... all of these themes appear frequently in the news. Yet, there are many misconceptions about them. This unit allows students to explore the science behind energy use and changes in the atmosphere. At the same time, students learn basic physical and earth/space science concepts related to light and electromagnetic radiation, the atmosphere, fossil fuels and combustion. Students also learn about the carbon cycle, the role of carbon dioxide in living systems and the important role of skin in protecting living organisms. Finally, students have opportunities to integrate their knowledge through explorations about the greenhouse effect, climate and alternative energy sources. Overviews of the science content covered in each section of this guide can be found in the one-page Physical Science, Life Science, and Environment and Health Basics overviews. The introduction to each activity also provides a summary of science concepts covered.



This pre-assessment is designed to allow you, the teacher, to estimate students' existing knowledge about these topics before beginning the unit. It also can be used for self-assessment by students once the unit is completed.

SETUP

Have students work individually to complete the pre-assessment.

PROCEDURE

1. Initiate a class discussion about sources of energy and energy use. Ask questions such as, *What is the source of energy for your family's car? What about for your computer? Where does the energy we need come from?* To build awareness, have students make a class list of the many different ways in which they rely on energy each day.
2. Follow by asking, *Do you think our uses of energy affect the environment?* Tell students that they will find answers to these and other questions over the next few weeks.
2. Give each student a copy of the pre-assessment. Have students complete the pre-assessments individually. Tell students that they will not be graded. Rather, they will use the pre-assessments to gauge how much they have learned over the course of the unit.
3. Collect completed pre-assessments and save them. Students will refer back to their answers at the conclusion of the unit.

CONCEPTS

- Allows teacher to estimate students' prior knowledge related to the atmosphere, carbon cycle, skin and skin cancer risk, and climate change.

OVERVIEW

Unit pre-assessment designed for use with students before beginning any unit activities. Will be revisited as part of Activity 11.

TIME

Preparation: 5 minutes
Class: 30 minutes

MATERIALS

- Each student will need:
- Copy of "Do You Know" student sheet (p. 2–3)

GLOBAL CHANGE

Global atmospheric change affects ecosystems, water, energy, transportation, agriculture and human health. The impacts differ from region to region and will grow under projected climate change.

Source: U.S. Global Change Research Program.

ANSWER KEY

- | | |
|------|-------|
| 1. b | 6. a |
| 2. c | 7. c |
| 3. b | 8. d |
| 4. d | 9. c |
| 5. a | 10. a |





Name _____

Circle the letter beside the correct answer to each question below.

- Where are fossil fuels found?
 - In a Geomuffin
 - Underground
 - In a tree
 - In the atmosphere
- Why is your skin important?
 - It sends messages to the circulatory system.
 - It can get sunburned.
 - It helps keep germs out of the body.
 - It has no layers.
- What is the source of almost all energy on Earth?
 - The moon
 - The sun
 - Electricity
 - The water cycle
- Most air pollution is found in which layer of the atmosphere?
 - Thermosphere
 - Mesosphere
 - Stratosphere
 - Troposphere
- Which of the following contains carbon?
 - Sugar
 - Water
 - Spoon
 - Glass
- Which answer about greenhouse gases is not true?
 - They are present in large amounts in the atmosphere.
 - They are produced by things people do.
 - We can't see them.
 - They help trap heat in the atmosphere.
- Which of the following zones has a climate with warm temperatures year-round?
 - Polar
 - Temperate
 - Tropical
 - Desert
- How could you estimate how much skin an orange has?
 - Squeeze out the juice.
 - Use the Law of Nines.
 - Make a rectangle.
 - Peel it and lay the skin out flat.
- A rainbow is made of:
 - tiny colored specks.
 - microwaves.
 - wavelengths of light.
 - a prism.
- When should a person wear sunscreen?
 - Every day
 - Only if a person gets sunburned easily
 - Only at the beach
 - Only if it is hot outside



Mide Tu Conocimiento



Mi Nombre _____

Haz un círculo alrededor de la letra que corresponde a la mejor respuesta.

- ¿Donde se encuentran los combustibles fósiles?
 - En un Bizcocho Geológico
 - Bajo tierra
 - En un árbol
 - En la atmósfera
- ¿Porque es importante la piel?
 - Envia mensajes al sistema circulatorio.
 - Puede quemarse con el sol.
 - Ayuda a mantener los gérmenes fuera del cuerpo.
 - No tiene capas.
- ¿De donde proviene casi toda la energía en la Tierra?
 - La luna
 - El sol
 - La electricidad
 - El ciclo del agua
- ¿Cual capa de la atmósfera tiene más contaminación?
 - Termósfera
 - Mesófera
 - Estratósfera
 - Tropósfera
- ¿Donde se puede encontrar el carbón?
 - En el azucar
 - En el agua
 - En una cuchara
 - En un vaso
- ¿Cual es la respuesta incorrecta acerca de los gases de invernadero?
 - Se encuentran en grandes cantidades en la atmósfera.
 - Se producen por medio de acciones humanas.
 - No los podemos ver.
 - Ayudan a atrapar el calor en la atmósfera.
- ¿Cual zona tiene un clima con temperaturas cálidas durante todo el año?
 - La zona polar
 - La zona templada
 - La zona tropical
 - El desierto
- ¿Como podrías estimar la cantidad de piel cubriendo una naranja?
 - Exprimir todo el jugo.
 - Usar la regla de los nueve.
 - Hacer un rectángulo.
 - Pelar la naranja y extender la piel sobre una superficie plana.
- Un arcoíris se hace de:
 - unos puntitos de colores.
 - las microondas.
 - diferentes longitudes de onda de la luz.
 - un prisma.
- Los fotoprotectores deben aplicarse:
 - todos los días.
 - tan solo si alguien se quema facilmente del sol.
 - tan solo en la playa.
 - tan solo si hace calor afuera.

